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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

Application No.: 10/043,320
Filing Date: January 14, 2002
Inventor (first named): Huang
Group Art Unit: 1745
Examiner Name: Tsang-Foster, Susy
Attorney Docket No.: 45283.5

OFFICIAL

Declaration Under 37 CFR Sec. 1.132


Province of Alberta
CANADA

I, Zheng Tang, also known as Eric Tang, of the City of Calgary, Province of Alberta, Canada hereby declare as follows:

1. I am an inventor of the above noted patent application (the '320 Application).
2. I was also an inventor of U.S. Patent Application No. 09/684,660, which is now U.S. Patent No. 6,420,064 (the '064 Patent).
3. Any invention disclosed but not claimed in the '064 Patent was derived from myself and Debabrata Ghosh, who is also an inventor of the '320 Application and the '064 Patent.
4. I make this Declaration in support of the patent application noted above.
I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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DECLARED this 6th day of July, 2004 at the City of Calgary,
Province of Alberta, Canada.

A handwritten signature in black ink, appearing to be 'Zheng Tang', written over a horizontal line.

ZHENG TANG also known as
ERIC TANG



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Percolation Theory

Percolation Theory represents one of the simplest models of a disordered system. Consider a square lattice, where each site is occupied randomly with probability p or empty with probability $1-p$. Occupied and empty sites may stand for very different physical properties. For simplicity, let us assume that the occupied sites are electrical conductors, the empty sites represent insulators, and that electrical current can flow between nearest neighbor conductor sites. At low concentration p , the conductor sites are either isolated or form small clusters of nearest neighbor sites. Two conductor sites belong to the same cluster if they are connected by a path of nearest neighbor conductor sites, and a current can flow between them. At low p values, the mixture is an insulator, since a conducting path connecting opposite edges of the lattice does not exist. At large p values, on the other hand, many conduction paths between opposite edges exist, where electrical current can flow, and the mixture is a conductor. At some concentration in between, therefore, a threshold concentration p_c must exist where for the first time electrical current can percolate from one edge to the other. Below p_c , we have an insulator; above p_c we have a conductor. The threshold concentration is called the percolation threshold, or, since it separates two different phases, the critical concentration.

Web Resources On Percolation Theory

<http://www.cna.org/isaac/Glossb.htm>

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